

SPECIAL PROVISION

CONTRACT NO. MO5935370

525 — DECORATIVE PORTLAND CEMENT CONCRETE

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**CATEGORY 500
PAVING****SECTION 525 — DECORATIVE PORTLAND CEMENT CONCRETE**

525.01 DESCRIPTION. Install decorative portland cement concrete (PCC) for non-traffic bearing median sections in locations as specified on the Plans. The decorative PCC shall be located, colored, and finished in conformance with the manufacturer's recommendations, as specified in the Contract Documents, and as directed by the Engineer.

PROJECT SPECIFIC WORK TO BE PERFORMED			
DESCRIPTION	LOCATION	FINISH 525.03.08	COLORANT 525.02.02
<u>Non-Traffic Bearing Medians</u> Final decorative surface shall simulate pattern, texture and coloration of real stone as they appear along the base of an existing wall face located along the Bethesda Crest Community property frontage immediately adjacent to the back side of concrete sidewalk on Southbound MD 355 (Wisconsin Avenue). See landscape plan construction details.	Bethesda Crest Community Wall along MD 355	(e)	(b)

525.01.01 Qualifications. Submit to the Engineer in writing, qualifications of the Contractor/subcontractor installing the decorative PCC to perform the work. This information is required as part of the subcontractor approval process. These qualifications shall include the following:

- (a) Records of the Contractor's/subcontractor's past successful experience in performing decorative PCC work. A minimum of five projects within the past three years is required. The documentation shall at least include project locations, names of clients, name and telephone number of an individual representing the owner, costs, and size of projects.
- (b) Documentation of the experience of the crew members including length of employment with the Contractor/subcontractor, work experience, work resume, and specialized education and training history. The paving superintendent/engineer shall have at least 3 years experience in decorative PCC work. The crew shall have no more than one trainee.

525.02 MATERIALS.

Aggregate	901
Portland Cement Concrete and Related Products	902
Reinforcement Steel	908
Joints	911

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525.02.01 Decorative PCC Mixes.

- (a) **Nontraffic Bearing Areas.** Nontraffic bearing areas (including but not limited to sidewalks and median sections) shall be constructed using Mix No. 6 concrete except that No. 7 aggregate shall be used, and the slump shall be 3 to 5 in.

525.02.02 Colorant. When a color is specified in the Contract Documents for the exposed surfaces of the decorative PCC, the color shall be selected from the Prequalified List of concrete colorant manufacturers maintained by the Office of Materials and Technology.

- (a) **Integral Concrete Colorant.** Integral concrete colorant shall be a mixture containing the correct dosage for the cement content in the mix design to create the desired color. The colorant when added during the mixing process shall produce an integrally colored concrete. The integral concrete colorant shall conform to C 979, shall be synthetic mineral-oxide pigments or colored water-reducing admixtures, color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
- (b) **Dry-Shake Hardener Colorant.** Dry-shake hardener colorant shall be a factory packaged dry mixture combination of portland cement, graded quartz aggregate, coloring pigments, and plasticizing admixture. The coloring pigments shall be finely ground, nonfading mineral oxides, interground with cement.

525.02.03 Release Agents. All release agents proposed for use shall conform to the recommendations of the prequalified concrete colorant manufacturer, as approved by the Engineer, and the following:

- (a) **Pigmented Powder Release Agent.** Pigmented powder release agent shall be a factory packaged dry mixture combination of surface conditioning and dispersing agents interground with coloring pigments that facilitates release of stamp mats. The coloring pigments shall be finely ground, nonfading mineral oxides interground with cement.
- (b) **Liquid Release Agent (Clear and Pigmented).** Liquid release agent shall be a mixture that is odorless and evaporates without leaving a residue. Liquid release agent shall be formulated to break the bond between mat type concrete tools.
- (c) **Polyethylene Film.** Polyethylene film shall be clear, a minimum of 1 mil in thickness, and conform to D 4397 except that the water vapor transmission rate requirement will be waived.

525.02.04 Evaporation Retarder. When an evaporation retarder is used, it shall be a waterborne, monomolecular film forming material, manufactured for application to fresh concrete.

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525.02.05 Waterborne, Membrane Forming Curing Compound. When integral coloring is used for concrete, waterborne, membrane forming curing compound shall conform to C 309, Type 1, Class B, specifically manufactured for colored concrete, or shall be a pigmented type approved by the coloring admixture manufacturer.

525.03 CONSTRUCTION. Refer to 520.03 and 603.03 for pavement and sidewalk construction, respectively.

Initiate the requirements for the Quality Control Plan, Preinstallation Meeting, Catalog Cut and Sample Panel submissions specified herein as soon as practical so as not to adversely affect the project schedule. Any delays caused by these or any other requirements specified herein shall be at no additional time or cost to the Administration.

Remove and replace decorative PCC that does not match the approved sample panels as determined by the Engineer or Landscape Architecture Division, or that is broken, damaged, or otherwise does not comply with this Specification. The removal shall be in complete sections from joint to joint or as approved by Engineer. The proposed removal procedures shall be approved by the Engineer prior to beginning removal operations. Adjacent areas shall be protected against damage at all times.

Decorative PCC shall be protected from damage during the curing process, as approved by the Engineer. Decorative PCC pavements shall be maintained free of stains, discoloration, dirt, and other foreign material.

525.03.01 Quality Control Plan. Submit a written Quality Control Plan to the Engineer for approval prior to the planned start of the decorative PCC work. The plan shall include how the Contractor intends to control the equipment and material application for the treatment process of the decorative PCC surface, and to ensure conformance with the manufacturer's recommendations and Contract Documents. The type of coloring method, color, and a list of materials proposed for use on the project shall be included. The Quality Control Plan approval is conditional, subject to final approval of the sample panel.

525.03.02 Quality Assurance. The Administration will provide quality assurance by:

- (a) Verifying that the imprinting tools and materials are compatible.
- (b) Monitoring the Contractor/subcontractor conformance with the Quality Control Plan.
- (c) Verifying the Contractor/subcontractor qualifications to produce this type of specialty concrete and compliance with these and the manufacturer's specifications.
- (d) Verifying the actual results of all Quality Control tests for the actual materials in the batch submitted for the project.

525.03.03 Equipment. Equipment shall be as specified in the Contract Documents, and approved by the Engineer prior to placing the sample panel. Use of uncoated aluminum equipment in contact with the surface of the plastic concrete is prohibited.

- (a) **Stamp Mats.** Stamp mats shall be semirigid mats with projecting textured and ridged underside capable of imprinting texture and joint patterns on plastic concrete.
- (b) **Stamp Tools.** Stamp tools shall be open grid, rigid stamp tools capable of imprinting joint patterns on plastic concrete.
- (c) **Texture Rollers.** When permitted, texture rollers shall be manually controlled, abrasion resistant rollers capable of imprinting texture on plastic concrete.
- (d) **Stencils.** When permitted, stencils shall be the manufacturer's standard moisture resistant paper or reusable plastic stencils, designed for use on plastic concrete.

525.03.04 Sample Panel. Prior to beginning any of the decorative PCC work, cast a sample panel for each finish, color, and texture required. The size of each sample panel shall be at least 48 x 48 in. by 4 in. thick or as required to demonstrate the typical pattern, texture, surface finish, color, joints, and standard of workmanship. Place the sample panel at a location approved by the Engineer.

The pattern, color, and textural finish of the sample panel shall be submitted for approval by the Landscape Architecture Division. In the event that the finish of the sample panel is rejected, additional sample panels shall be submitted at no additional cost to the Administration until the finish is approved. Final approval will be given only after the sample panel has been allowed to cure for the full 28 day period. The sample panel shall remain on the site to be used by the Engineer as a basis for comparison for the elements to be constructed on the project.

525.03.05 Prerequisites and Preinstallation Meeting. Conduct a Preinstallation Meeting at the project site to review procedures for ensuring quality of concrete materials and decorative PCC pavement construction practices. At least a 10 day notice of the meeting shall be provided to the following representatives and anyone else that is directly concerned with decorative PCC pavement. Submit the manufacturer's actual certified test results of all Quality Control tests conducted on each lot or batch proposed for use on the project.

- (a) Contractor's superintendent responsible for the colored and imprinted concrete, and subcontractor's superintendent if applicable.
- (b) Sampling and testing agency responsible for concrete design mixes.
- (c) Ready-mix concrete producer.
- (d) Decorative cement concrete pavement installer.

- (e) Manufacturer's technical representative for decorative cement concrete pavement system.
- (f) The Engineer and representative from the Landscape Architecture Division.

525.03.06 Initial Finishing for All Decorative Concrete. Adding water to concrete surfaces during finishing operations is prohibited.

The second float finishing operations shall begin when bleed water has disappeared and concrete surface has stiffened sufficiently to permit operations. The surface shall be finished to true planes by floating with power driven floats except that hand floating may be used in small or inaccessible areas.

525.03.07 Color Finish with Pigmented Mineral Dry Shake Hardener.

- (a) **Pigmented Mineral Dry Shake Hardener Finish.** After initial floating, pigmented mineral dry shake materials shall be applied to pavement surfaces in conformance with the manufacturer's written recommendations and as stated in the approved Quality Control Plan, at a rate and manner that will produce a pavement color matching the approved sample panel.
- (b) **Pigmented Powder Release Agent.** When permitted, release agent shall be distributed uniformly onto pigmented mineral dry shake hardened and still plastic concrete at a rate recommended by the manufacturer and as stated in the approved Quality Control Plan.
- (c) **Liquid Release Agent.** When permitted, release agent shall be misted uniformly onto the surface of pigmented mineral dry shake hardener and plastic concrete at a rate recommended by the manufacturer and as stated in the approved Quality Control Plan.

525.03.08 Final Finishing and Texturing for All Decorative Concrete. One or more of the following finishes and textures shall be applied after the final floating as specified in the Contract Documents and as directed by the Engineer. The finish shall be consistent with the approved sample panel. Work that is not consistent with the approved sample panel shall be removed and replaced at no additional cost to the Administration. Finished surfacing for Decorative Portland Cement Concrete in traffic bearing crosswalks shall comply with the Administrations's Accessibility Guidelines for Pedestrian Facilities. Finished surfacing for Decorative Portland Cement Concrete in non-traffic bearing median sections do not require this compliance.

- (a) **Burlap Finish.** A seamless strip of damp burlap shall be dragged across the float finished concrete surface, perpendicular to line of traffic, to provide a uniform gritty texture.
- (b) **Medium to Fine Textured Broom Finish.** A soft bristle broom shall be drawn across the float finished concrete surface, perpendicular to the line of traffic, to provide a uniform fine-line texture.

- (c) **Medium to Coarse Textured Broom Finish.** A stiff bristle broom shall be drawn across the float-finished concrete surface perpendicular to the line of traffic, to provide a coarse, striated finished surface 1/16 to 1/8 in. deep.
- (d) **Stenciling.** Stencils shall be cut to the slab width and laid on wet concrete. The trailing edge of each section of stencil shall overlap the mortar joint onto the leading mortar joint of previous section.
- (1) Paper stencil shall be slightly embedded into concrete by rolling with stencil roller.
 - (2) Stencils shall be trimmed to fit the slab and special patterns.
 - (3) Pigmented mineral dry shake hardener materials shall be applied to concrete surfaces in conformance with the manufacturer's written instructions and recommendations.
 - (4) When a texture roller is to be used, a release agent shall be applied in conformance with the manufacturer's written recommendations and as stated in the approved Quality Control Plan prior to applying the texture roller to the surface of the concrete.
 - (5) Stencils shall be removed when the concrete has sufficiently cured to bear weight. Stencils shall not be left in the concrete overnight.
 - (6) All debris shall be removed from the surface prior to application of curing compound, in a manner and time period as recommended by the manufacturer and as stated in the approved Quality Control Plan.
- (e) **Mat Stamping.** Catalog Cuts of selected Mats intended for use that adequately demonstrate textures and patterns intended as specified in Section 25.01- Description shall be submitted for approval by the Landscape Architecture Division before purchasing products. Release agents shall be applied in conformance with the approved Quality Control Plan. While initially finished concrete is plastic, stamp mats shall be accurately aligned and placed in sequence. Mats shall be uniformly loaded and pressed into concrete to produce the specified imprint pattern and depth of imprint on concrete surface. Stamp mats shall be removed immediately. Edges and surfaces that cannot be imprinted by stamp mats may be stamped by hand.
- Unembedded release agent shall be removed in a manner and time period as recommended by the manufacturer and as stated in the approved Quality Control Plan.
- (f) **Tool Stamping.** Release agents shall be applied in conformance with the approved Quality Control Plan. While initially finished concrete is plastic, stamp tools shall be accurately aligned and placed in sequence and tamped into the concrete to produce the specified imprint pattern and depth of imprint on concrete surface. Stamp tools shall be removed immediately. Edges and surfaces that cannot be imprinted by stamp tools may be stamped by hand. When used, polyethylene film shall be removed immediately after tool stamping.

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(g) **Roller Stamping.** Release agents shall be applied in conformance with the approved Quality Control Plan. While initially finished concrete is plastic, roller shall be accurately aligned and the rolling operation repeated to produce the specified imprint pattern and depth of imprint on concrete surface. Edges and surfaces inaccessible to roller may be stamped by hand. When used, polyethylene film shall be removed immediately after roller stamping.

525.03.09 Curing Decorative Concrete. Curing shall begin after finishing the concrete but not before the free water has disappeared from the concrete surface.

Curing compound shall be applied immediately after final finishing in a uniform and continuous operation in conformance with the manufacturer's recommendations, the approved Quality Control Plan, and as directed by the Engineer. Areas that have been subjected to heavy rainfall shall be recoated within three hours after application. The continuity of the curing agent shall be maintained during the curing period.

525.03.10 Warranty Period. Refer to GP-4.10.

525.04 MEASUREMENT AND PAYMENT. The payment will be full compensation for all concrete coloring agents, release agents, concrete, forms, reinforcement steel, chairs, coatings, finishing, curing, joints, saw cutting, joint sealing, and for all material labor, equipment, tools and incidentals necessary to complete the work.

525.04.01 Nontraffic Bearing Decorative Portland Cement Concrete Median will be measured and paid for at the Contract unit price per square yard of finished surface.